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ABSTRACT

The motor creativity of preschoolers when encountering a novel piece of athletic equipment was observed and analyzed. The London Trestle Tree Apparatus, consisting of eight trestles of various sizes, two poles, a rope ladder, two ropes, pommel top, rubber top, balance bar, slide plank, ladder, and beat board was erected for the children to use in unstructurted free play. The subjects were observed and videotaped in three trials of five minutes each. No instructions were given to the child during filming; the child made all decisions on where and how to move. The children were observed for development of motor fluency and originality. It was concluded that the preschoolers were no more creative in their movement responses to a novel piece of play apparatus after a one-month period of play in an unstructured play setting than they were at the initial exposure to the apparatus. (JD)

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Introduction

Studies on creativity in children have focused primarily on the cognitive aspects of creative development. In 1966, however, Wyrick (36) began to experiment with creativity in the psychomotor domain. Adapting Torrance's Tests of Creativity (32) to motor challenges, Wyrick devised a test of motor creativity based upon two widely recognized components of creativity, fluency and originality.

Although numerous researchers are now using Wyrick's test, none had applied her concepts to preschool children until Sherrill and Rowe (26) condicted their pilot study in 1975. This investigation is a replication of the Sherrill and Rowe research design, using a different piece of novel play apparatus.

Statement of the Problem

This investigation entailed a study of the motor creativity of twenty preschoolers on a novel piece of equipment, the Trestle Tree Apparatus. Videotape data were collected over three trials showing the rate of change in motor fluency and motor originality for three and four year old children over a month period during which no experimental condition was introduced.

Hypotheses of the Study

The following hypotheses were tested:

(1) There is no significant difference at the .05 level between trials one and two and at the .20 level between trials two and three on motor fluency and motor originality.

(2) There is no significant difference at the .05 level between girls and boys on trials one and two and at the .20 level between trials two and three on motor fluency and motor originality.

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Definitions and/or Explanations

According to Wyrick (36), motor creativity is composed of motor fluency and motor originality. Motor fluency is the production of as many ideas or movements as possible in a given amount of time. In this study, responses were the number of contacts made with the Trestle Tree Apparatus during the five minute period. Motor originality, the second aspect of motor creativity, is the uniqueness of movement responses. Those movements which occurred the least frequently among a group of children were considered original. The motor originality score was the sum of the least frequent responses of each subject.

The London Trestle Tree Apparatus consists of the following ten interchangeable parts: 8 trestles of various sizes, 2 poles, a rope ladder, 2 ropes, pommel top, rubber top, balance bar, slide plank, ladder, beat board.

Subjects

The subjects were twenty children, ages three and four, who attended the Texas Woman's University Preschool and Child Care Center during the spring semester of 1976-1977. The children, ten boys and ten girls, were randomly chosen from among those whose parents returned permission forms for participation in the study.

Collection of the Data

Subjects were videotaped individually for five minutes in an unstructured play setting at the TWU Preschool and Child Care Center in room 34 and 35, with the first filming on April 5, 1977, the second trial on April 19, 1977, and the third trial on May 2, 1977. A Sony AVC-3400 portable videotape camera and black and white, half inch, thirty minute videotapes were used to record the data.

Each child was assigned a film number to preserve anonymity of subjects. This number and film session were recorded by the technician at the beginning of each subject's session. A single tape included five to seven individual performances depending on the length of performance of each subject.

The mechanics of filming were those used by Sherrill and Rowe (26) in their pilot study. The camera was mounted on a tripod in order to maintain the same filming level and angle for each subject. The tripod was raised to a height of three feet from the floor, a distance of eighteen feet from the closest apparatus, the balance beam trestles, and the farthest apparatus, the large trestles, at thirty feet. The camera was in the same position for each filming session. The Trestle Tree Apparatus was placed with equal distance from walls and doorways, with room lighting, temperature, and outside noise relatively constant during the filmings.

The investigator and technician visited with the children before the filming began in order to minimize the possibility of the Hawthorne Effect. Subjects were filmed singly, with only the investigator and videotape technician in the filming area. When entering the filming area, the subject was told that "he/she could do anything he/she wished to do on the climbing apparatus." The subject entered the room from the left of the far side of the camera. As the subject crossed a tape line at the doorway entrance, the filming began. Timing of the play period began when he/she made the initial contact with the Trestle Tree Apparatus. No instructions were given to the child during the filming. Questions asked or comments made by the child were not given any type of response. The investigator, who acted as a spotter, did not move from the tape line at the doorway until the subject

moved. The child made all of the decisions on where to move and how to move. The spotter followed and assisted only when the child asked her to do so or to prevent a possible injury. If the subject did not respond to the apparatus after 30 seconds, the preliminary statement was repeated that "he/she could do anything he/she wished on the climbing apparatus". If the subject still did not perform, he/she was led by the arm to the apparatus where the same sentence was again repeated. If no response resulted or the asked to return to his/her room, the filming was ended.

Tabulation of the Data

The resulting videotapes were viewed on a 9 inch TV monitor by two raters who independently recorded the frequencies with which each part of the Trestle Tree Apparatus was touched and the frequencies of specific motor responses exhibited during the touches. Accurate tabulation was assured by watching each videotape as many times as needed to record all touches and movement patterns.

Tabulation entailed the use of preconstructed individual motor fluency score sheets and individual motor originality score sheets. The motor fluency score sheets were used to tabulate the frequency with which the subject touched the parts of the Trestle Tree Apparatus during the first, second, and third filmings. The individual motor originality score sheets were used to tabulate the frequency of specific motor responses by each piece of apparatus.

Scoring of the Data

The scoring techniques used by Sherrill and Rowe (26) and Wyrick (37) were paralleled with minor modifications. Single raw scores for motor fluency and motor originality were derived for each subject for each trial.

Motor fluency scores were determined by adding to get the sum of the touches on all pieces of apparatus combined over the five minute trial.

Motor originality scores were derived by the following modification of techniques by Sherrill and Rowe (26): (1) listing each specific motor response that appeared on the videotapes and making a tabulation sheet for recording these responses for individual subjects; (2) developing a frequency distribution summarizing the number of times each specific motor response was made by the total group; (3) labeling responses made by the total sample only once as original and assigning five points to any subject making such an original response; (4) labeling responses made by the total sample only twice as semi-original, and assigning four points to the subject; (5) labeling responses made by only three subjects as semi-original and assigning three points; (6) labeling responses made by only four subjects as semi-original and assigning two points; (7) labeling responses made by five subjects as semi-original and assigning one point; and (8) labeling responses made by six or more subjects as unoriginal and assigning no points.

The procedure used by Sherrill and Rowe (26) to determine a motor creativity score for each subject was followed. The conversion or raw motor fluency and raw motor originality scores into standard scores after which an average was computed was designated the motor creativity score.

Objectivity and Reliability of the Tabulation and Scoring Procedures

The frequencies recorded independently by the two raters were correlated by the analysis of variance within class correlation coefficient method. The correlation of objectivity for motor fluency trials was .998. The correlation of objectivity for motor originality trials was .25 - .65.

Test-retest reliability coefficients for each rater were computed also by the Spearman Rank-Order Correlation. The resulting reliability coefficients for rater A and rater B for motor fluency and motor originality were respectively .999 and .936, and .988 and .931.

Treatment of the Data

All comparisons between trials were made by one and two way analysis of variance with repeated measures. After the statistical treatment was completed, the data were organized into individual subject graphs. The motor fluency and motor originality scores were presented on the graph with color coding to distinguish between them.

Findings of the Study

(1) The first finding indicated that motor fluency scores were not significantly different over trials. This suggests that the children did not make more contacts during the second and third contacts with the Trestle Tree Apparatus than they did during the initial contact with the novel piece of apparatus, i.e. motor fluency appears to be a relatively stable trait, at least when no guided discovery or other form of instruction is provided between trials.

(2) The second finding indicated that there was no significant difference from trial to trial between boys and girls on motor fluency.

(3) The third finding revealed no significant difference from trial to trial in motor originality for the group. This suggests that the group did not make more original or semi-original movement responses on trial two and three than they did on trial one. This seems to indicate that motor originality is a relatively stable trait when no intervening experimental condition was introduced.

(4) The fourth finding indicated that there was no significant difference over trials between boys and girls in motor originality.

No significant interactions between groups over trials was identified. No subsequent test was therefore performed on cell means. The four F rations did not exceed the required level for significance (.05 and .20). The four null hypotheses therefore could not be rejected at the designated levels of significance.

Motor creativity scores were computed based upon converting the raw scores of motor fluency and motor originality into standard scores, and computing their average in whole integers. A comparison of Rowe's (23) non-handicapped group with these data indicate compatibility. Rowe's range for motor creativity scores was 37-65, with a mean of 49.94. This investigation resulted in a motor creativity range of 28-64, with a mean of 50.00. These data appear to be indicative of normal preschool populations.

Summary

It was concluded that the preschoolers were no more creative in their movement responses to a novel piece of play apparatus after a one-month period of play in an unstructured play setting than they were at the initial exposure to the apparatus.

The lack of trial to trial change suggests the possibility that a one month period is too brief a time to expect change to occur in creativity. Although changes in mean scores from trial to trial fluctuated and could be interpreted to show changing movement responses as the apparatus became less novel, the changes from trial to trial were not significant.

The findings of this study seem to support those authorities who believe that creativity, like self concept and other traits within the affective domain, is relatively stable. Although trial to trial change was studied only for mentally retarded preschool children in the pilot study by Sherrill and Rowe (26), no change in motor fluency or motor originality was reported even after eight weeks of daily guided discovery. On the other hand Rowe (23) found significant trial to trial changes in motor fluency ($F = 20.32$) and motor originality ($F = 11.80$) after four weeks of daily guided discovery. In spite of these findings, Rowe found no significant differences between baseline scores of nonhandicapped children and the post-test scores of the mentally retarded subjects on motor fluency.

The investigators believed that the lack of socialization between subject and investigator during the filming did not foster the normal incentives to perform to their best abilities, whereas a more humanistic approach might have enhanced these abilities. Further investigations in this area might involve filming individual children over extended periods of time in appropriate social settings with two way communication between subject and investigator or observing the motor creativity of children in group settings amongst their peers. Comparing motor fluency and motor originality scores with various handicapped and nonhandicapped children should provide educators with clues to facilitating the creative process.

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